



Groundwater Flood Risk Assessment — Winterbourne valley site, Hampshire

FINAL · issued following competent-person review · generated
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Assessment (GWFRA)

Report reference: SGW-20260904-FD0E

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SAMPLE REPORT

Executive summary

Class B Groundwater flood susceptibility at this site is assessed by Strata's open-data susceptibility method as **Class B** — “The susceptibility method indicates groundwater capable of affecting property below ground level (Strata B-equivalent band).”.

Assessment	Groundwater flood risk assessment (desk-based)
Result	Groundwater flood susceptibility at this site is assessed by Strata's open-data susceptibility method as Class B — “The susceptibility method indicates groundwater capable of affecting property below ground level (Strata B-equivalent band).”.
Mapped mechanism	Superficial Deposits Flooding (derived)
Estimated winter-high groundwater	≈ 0.76 m below ground level (see §2B)
Further work indicated	Site-specific consideration indicated where below-ground elements are proposed (see §4).

Susceptibility describes physical potential, not likelihood, depth or level — see §6. Fluvial, tidal, surface-water, sewer and reservoir sources are not assessed here.

Source of flood risk	Baseline ¹	After analysis ²	After mitigation ³
Groundwater	Moderate susceptibility (Class B)	Moderate susceptibility (Class B) confirmed; winter-high $\approx$ 0.76 m below ground; emergence at the 1-in-100 winter condition; recorded groundwater flooding at/near the Site	Low residual — with below-ground design measures per §4
Other sources	Indicative results at §2A — each source requires its own assessment where material		

¹ Baseline: Strata national susceptibility method (v0.3), validated against EA recorded events. ² After analysis: site evidence — observed-record groundwater levels (§2B) and recorded flood history (§2A). ³ After mitigation: qualitative residual position assuming the §4 measures are implemented; no probability is assigned (§6).

DETERMINATIONS

Groundwater susceptibility: **Class B** — worst case across the red-line boundary **DERIVED** §2

Groundwater levels: winter-high $\approx$ 0.76 m below ground; emergence indicated at the 1-in-100 winter condition **ESTIMATE** §2B

Flood history: recorded groundwater flooding at or near the site **VERIFIED** §2A

Other flood sources: indicative only — each requires its own assessment where material **INDICATIVE** §2A

Development guidance: consider monitoring before any below-ground element is fixed; check infiltration SuDS against the seasonal high water table **GUIDANCE** §4

Auto-derived one-line summary of this assessment. Labels: VERIFIED = source records; DERIVED = Strata engine output (v0.3, validated against EA recorded events); ESTIMATE = stated-method estimate; INDICATIVE = indication only. The competent-person sections (§3, §4, §7) govern. No finished-floor level is produced (§6).

1. Site and scope of this assessment

Site reference	Winterbourne valley site, Hampshire
Proposed development	Residential development
Location (British National Grid)	E 436,760 N 124,150 (site centroid)
Site area	0.48 ha (red-line boundary, 4 vertices)
Assessment basis	Worst case across 5 assessed points within the site boundary (centroid and vertices)
Assessment	Groundwater flood risk assessment (GWFRA)
Result schema	gwfra_screen_v1
Generated	2026-09-04T19:20:26+00:00

This report assesses **groundwater** as a source of flooding. It does not assess fluvial, tidal, surface-water, sewer or reservoir sources, which are separate mechanisms requiring separate assessment. Groundwater and sewer flooding interact — a high water table drives infiltration into and surcharging of the drainage network — but the hydraulic capacity of the sewer network is not assessed here.



Figure 1. Site location plan. Contains OS data © Crown copyright and database right 2026

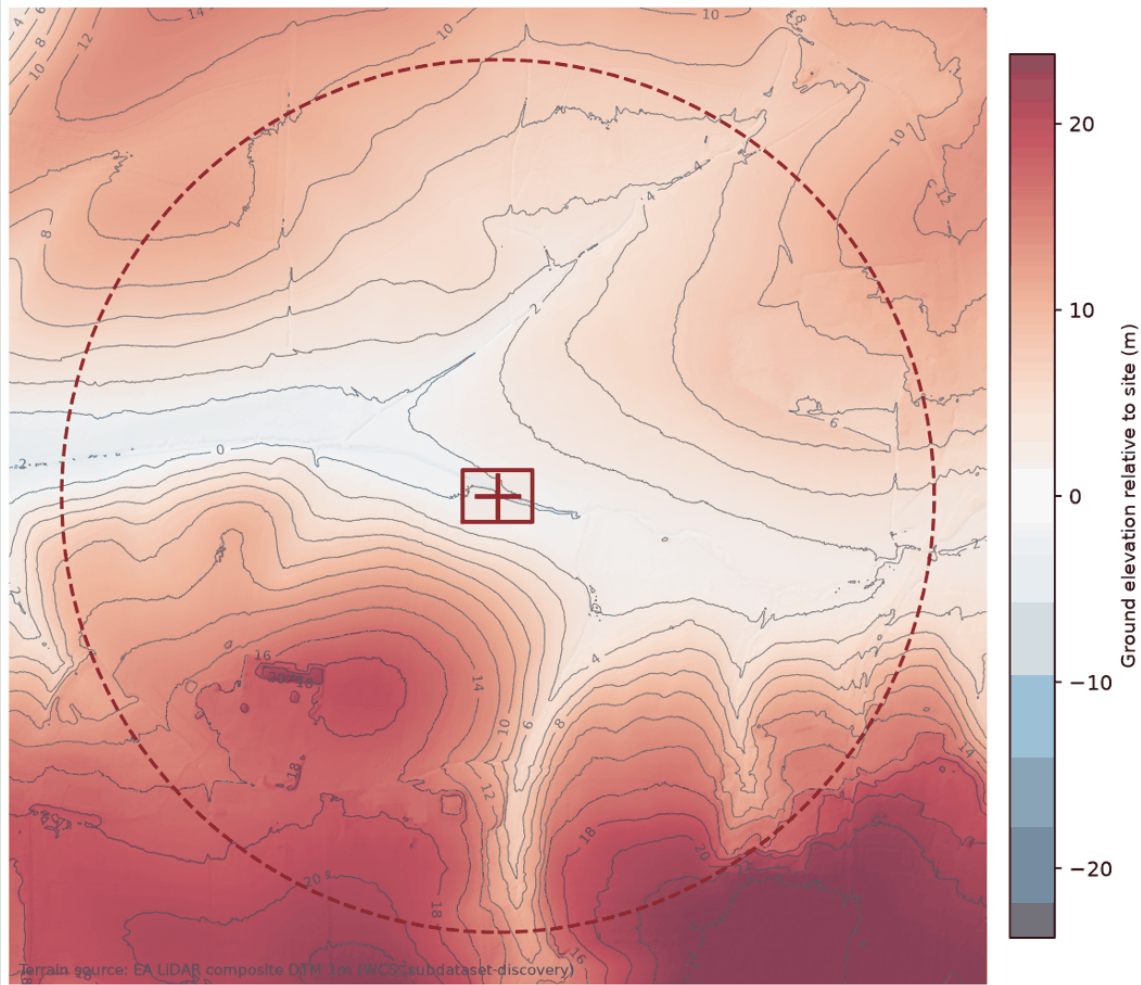


Figure 2. Relative ground elevations (500 m radius). LIDAR © Environment Agency copyright and/or database right 2022. All rights reserved.

1A. Geological and hydrogeological setting

The mapped bedrock is **London Clay Formation** (permeability class low, by lithology classification after BGS CR/06/160N). Superficial cover is mapped as **Alluvium** (permeability class high). This setting is consistent with **superficial-deposits groundwater flooding**: water accumulating within permeable drift above less permeable strata. Ground level at the site is 24.69 mAOD; the nearest mapped watercourse base level lies approximately 1.9 m below site ground, taken as a first indication of local depth to the water table.

2. Groundwater susceptibility

Assessment status	Classified — susceptibility band mapped
Susceptibility band	Class B
Mapped mechanism	Superficial Deposits Flooding (derived)
Classification	The susceptibility method indicates groundwater capable of affecting property below ground level (Strata B-equivalent band).

Band shown is the worst case across 5 points assessed within the red-line boundary; the governing point is E 436,760 N 124,150. Per-point results are retained in the assessment record.

Susceptibility band – not a risk rating, not a likelihood, not a level.
See §6.

2A. Flood history and other sources at this location

EA recorded flood outlines within 250 m	5 outline(s) The site lies within a recorded flood outline
...of which groundwater-attributed within 250 m	5 outline(s) recorded event(s): Winter1995, Lower Test, Aerial (1995). The site lies within a recorded groundwater flood outline
EA Historic Flood Map	Not within nearest extent $\approx$ 489 m
EA Flood Zone (rivers and sea)	Not within Zone 2/3 (Zone 1)
Risk of Flooding from Rivers and Sea (RoFRS)	Not in an at-risk area
Risk of Flooding from Surface Water	Not within mapped extents
Nearest EA/NRW Main River	$\approx$ 1356 m
EA Flood Warning Area	Site not within one
EA Flood Alert Area	Site not within one
EA groundwater flood alert area	Site not within one
Reservoir flood extent (wet day)	Not within
Reservoir flood extent (dry day)	Not within

Automated checks against national datasets held by Strata; distances measured from the site point. These are indicative results for sources other than groundwater; each source requires its own assessment where material. Groundwater is assessed in this report.

2B. Groundwater level assessment

Anchor station	Baileys Down — observed record 1964–2026 (63 hydrological years)
Site ground elevation	24.83 mAOD (EA LIDAR)
Estimated winter-high groundwater	24.07 mAOD — ≈ 0.76 m below ground at the site (station inter-annual variability ± 3.61 m, bounded at ground on the valley floor)
1-in-100 winter condition	reaches ground level at the site — groundwater emergence at the 1-in-100 winter condition (the anchor station's exceedance margin, 22.2 m, exceeds the 0.76 m of available depth; level bounded at ground — the valley floor is a discharge boundary)

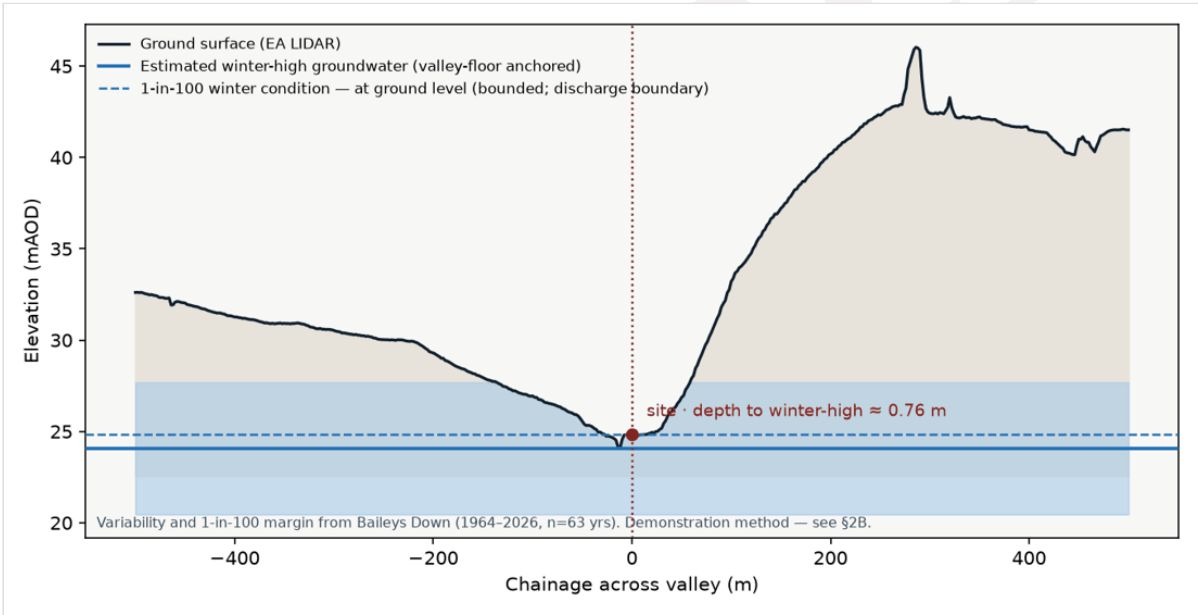


Figure 3. Valley cross-section with estimated winter-high groundwater. LIDAR © Environment Agency. Groundwater level statistics from EA Hydrology API observed records (Open Government Licence).



Figure 4. EA groundwater monitoring stations anchoring the estimate. Station data: EA Hydrology API (OGL). Contains OS data © Crown copyright and database right 2026.

Level-estimate method (§2B). Winter-high groundwater is anchored at the valley floor along an EA LIDAR cross-section; inter-annual variability and return-period margins are taken from observed annual maxima at the anchor station (EA Hydrology API, Open Government Licence), Gumbel method-of-moments. Levels are bounded at ground level on the valley floor, which is a discharge boundary. A conservative stated-method construction; Strata's modelled level product will refine it.

Method summary: the winter-high water table is anchored at the valley floor along a LIDAR cross-section; year-to-year variability and the 1-in-100 condition are transferred from the observed station record. This is an estimated groundwater level, not a flood prediction — emergence depends on pathway and duration. §6 applies.

3. Interpretation

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The site lies within ground classified by the Strata open-data groundwater susceptibility method as **Class B** — “The susceptibility method indicates groundwater capable of affecting property below ground level (Strata B-equivalent band).” — the intermediate mapped band. The mapped mechanism is recorded as **Superficial Deposits Flooding (derived)**: the mechanism recorded in the source dataset. This band indicates that groundwater may rise to a level capable of affecting structures **below ground level** — basements, lift pits, deep foundations, buried services and drainage — without necessarily emerging at the surface. Where the proposal includes any below-ground element, the competent person should consider whether site-specific groundwater monitoring is warranted before design is fixed. Susceptibility is not likelihood: this classification describes physical potential given the underlying geology, not the chance of flooding in any given year. Auto-drafted from the assessment result; the competent person confirms against site-specific information.

4. Recommended actions

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1. Establish whether the proposal includes any below-ground element; if so, treat groundwater as a design constraint. **2.** Consider site-specific groundwater monitoring before basement or deep-foundation design is fixed. **3.** Check infiltration-drainage viability against the seasonal high water table rather than a spot measurement. **4.** Specify tanking or drained-cavity protection where below-ground space is retained. Confirmed by the competent person.

5. Data source, coverage and licensing

Strata Groundwater Susceptibility Method (open data, v0.3). Geology: BGS Geology 50K via OGL web service (Contains British Geological Survey materials (c) UKRI). Permeability classification after BGS report CR/06/160N. Water-level proxy: EA LIDAR terrain with OS Open Rivers. An independent Strata method with Strata banding thresholds (stated below); distinct from the BGS Susceptibility to Groundwater Flooding dataset.

Derived-method summary: geology sampled at the site from the BGS Geology 50K WMS (bedrock and superficial); permeability by lithology classification after the published BGS methodology; depth-to-water proxy from EA LIDAR river base levels along OS Open Rivers; Strata banding thresholds (C < 1.0 m, B < 3.0 m, A < 7.0 m depth-to-water proxy).

Where a proprietary modelled groundwater product exists for the Site (for example GeoSmart's GW5), the two outputs are **complementary, not comparable**: such products model emergence probabilistically from proprietary data, while this assessment derives susceptibility and observed-record levels from open national sources with its method stated in full.

[[GOVERNANCE]] Strata groundwater susceptibility method — open data. This result is produced by Strata's independent susceptibility method from open national sources (BGS Geology 50K under OGL, EA LIDAR terrain, OS Open Rivers), following the published BGS conceptual-model structure with Strata's own banding thresholds, stated in this section. In development validation against Environment Agency records of groundwater flooding (150 recorded events, records from 1946), the method's discrimination was statistically indistinguishable from the EA's operational groundwater flood alert areas. Bands are Strata classifications, distinct from the BGS Susceptibility to Groundwater Flooding dataset; where a decision requires the BGS dataset or site-specific investigation, §6 applies. Full validation methodology available on request.

6. Limitations of this assessment

What this assessment is. This is an automated desk-based assessment against Strata's open-data susceptibility method (v0.3). Susceptibility describes whether the underlying geology and hydrogeology are capable of producing groundwater flooding. It is **not** a likelihood, **not** an annual probability, and **not** a depth or level. The susceptibility method itself produces no groundwater level; the §2B level estimate is a demonstration construction from observed station records and terrain (method in §2B and §5), not a site measurement, and no finished-floor level is derived. No borehole record, monitoring well, or seasonal water-table observation has been consulted. This assessment is not, and must not be represented as, a deterministic groundwater emergence model. The same ceiling binds any desk-study groundwater assessment drawn from this dataset, whether produced automatically or by hand. **Method limits.** Geology is sampled at the site from the BGS Geology 50K WMS; permeability is a lithology-keyword classification; the water-level proxy is river base levels from LIDAR, not a groundwater surface; and the A/B/C-equivalent bands use the Strata thresholds stated in §5 — they are not BGS classifications.

The underlying mapping is national in scale, at approximately 50 m resolution. It is not appropriate for determining conditions at a specific point within a site, and it postdates no site-specific investigation. Local features not represented include perched water tables, made ground, historic mine or quarry workings, buried services acting as preferential pathways, and the influence of adjacent development or dewatering. Where the assessment indicates susceptibility, or where the proposal is sensitive to groundwater, site-specific investigation remains the only means of establishing actual water-table behaviour.

7. Conclusions

COMPETENT-PERSON SECTION · REVIEWED AND CONFIRMED

The assessment classifies groundwater flood susceptibility at this site as **B**, with estimated winter-high groundwater ≈ 0.76 m below ground and groundwater emergence indicated at the 1-in-100 winter condition, against a documented local history of groundwater flooding (§2A). The recommended actions in §4 apply; the limitations in §6 form part of this conclusion. Confirmed by the competent person.

Reliance and terms

This assessment is provided for the named client and the stated proposal. It may not be relied upon by any other party, or for any other purpose, without Strata's prior written consent. It is provided subject to Strata's standard terms of business, available on request; the limitations at §6 form part of those terms.

References

1. BGS Report CR/06/160N — permeability classification methodology. 2. Environment Agency, Recorded Flood Outlines (data.gov.uk, OGL). 3. Environment Agency Hydrology API, observed groundwater levels (environment.data.gov.uk/hydrology, OGL). 4. BGS Geology 50K web map service (map.bgs.ac.uk, OGL). 5. Ordnance Survey Open Rivers and Open Zoomstack (OS OpenData, OGL). 6. Strata WS1 validation protocol and results — available on request.

Strata Groundwater Flood Risk Assessment (open-data methods). Geology: Contains British Geological Survey materials © UKRI (OGL WMS). Terrain: © Environment Agency. Rivers: OS data © Crown copyright and database right 2026. Not the BGS Susceptibility to Groundwater Flooding dataset; the Strata thresholds in §5 apply; see also §6. The §2B groundwater level is an estimate from observed records, not a site measurement; no finished-floor recommendation is produced. Issued following competent-person review and approval. Strata Flood · strata-flood.uk